BLF2425M7L100; BLF2425M7LS100

Power LDMOS transistor

AMPLEON

Rev. 2 — 1 September 2015

Product data sheet

1. Product profile

1.1 General description

100 W LDMOS power transistor for industrial applications at frequencies from 2300 MHz to 2400 MHz.

Table 1. Typical performance

Typical RF performance at T_{case} = 25 °C in a common source class-AB production test circuit.

Test signal	f (MHz)	I_{Dq} (mA)	V_{DS} (V)	$P_{L(AV)}$ (W)	G_p (dB)	η_D (%)	$ACPR_{885k}$ (dBc)	$ACPR_{5M}$ (dBc)
IS-95	2300 to 2400	900	28	20	18	27	–46[1]	-
1 carrier W-CDMA	2300 to 2400	900	28	30	18.7	33	-	–40[2]

[1] Single carrier IS-95 with pilot, paging, sync and 6 traffic channels (Walsh codes 8 - 13). PAR = 9.7 dB at 0.01 % probability on the CCDF. Channel bandwidth is 1.2288 MHz.

[2] 3GPP; test model 1; 64 DPCH; PAR = 7.2 dB at 0.01 % probability on CCDF. Channel bandwidth is 3.84 MHz.

1.2 Features and benefits

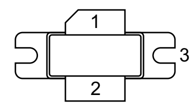
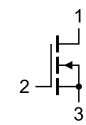
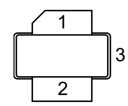
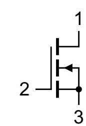
- Excellent ruggedness
- High efficiency
- Low R_{th} providing excellent thermal stability
- Designed for low memory effects providing excellent digital pre-distortion capability
- Internally matched for ease of use
- Integrated ESD protection
- Compliant to Directive 2002/95/EC, regarding Restriction of Hazardous Substances (RoHS)

1.3 Applications

- RF power amplifiers for industrial and multi carrier applications in the 2300 MHz to 2400 MHz frequency range

2. Pinning information

Table 2. Pinning

Pin	Description	Simplified outline	Graphic symbol
BLF2425M7L100 (SOT502A)			
1	drain		 sym112
2	gate		
3	source [1]		
BLF2425M7LS100 (SOT502B)			
1	drain		 sym112
2	gate		
3	source [1]		

[1] Connected to flange.

3. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BLF2425M7L100	-	flanged ceramic package; 2 mounting holes; 2 leads	SOT502A
BLF2425M7LS100	-	earless flanged ceramic package; 2 leads	SOT502B

4. Limiting values

Table 4. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions	Min	Max	Unit
V_{DS}	drain-source voltage		-	65	V
V_{GS}	gate-source voltage		–0.5	+13	V
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		-	200	°C

5. Thermal characteristics

Table 5. Thermal characteristics

Symbol	Parameter	Conditions	Typ	Unit
$R_{th(j-c)}$	thermal resistance from junction to case	T_{case} = 80 °C; P_L = 100 W	0.3	K/W

6. Characteristics

Table 6. DC characteristics

T_j = 25 °C unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{(BR)DSS}$	drain-source breakdown voltage	V_{GS} = 0 V; I_D = 1 mA	65	-	-	V
$V_{GS(th)}$	gate-source threshold voltage	V_{DS} = 10 V; I_D = 150 mA	1.5	1.8	2.3	V
I_{DSS}	drain leakage current	V_{GS} = 0 V; V_{DS} = 28 V	-	-	5	μA
I_{DSX}	drain cut-off current	V_{GS} = $V_{GS(th)}$ + 3.75 V; V_{DS} = 10 V	25.1	29	-	A
I_{GSS}	gate leakage current	V_{GS} = 11 V; V_{DS} = 0 V	-	-	500	nA
g_{fs}	forward transconductance	V_{DS} = 10 V; I_D = 5.35 A	-	10.5	-	S
$R_{DS(on)}$	drain-source on-state resistance	V_{GS} = $V_{GS(th)}$ + 3.75 V; I_D = 5.25 A	-	0.1	-	Ω

Table 7. RF characteristics

Test signal: single carrier IS-95 with pilot, paging, sync and 6 traffic channels (Walsh codes 8 - 13). PAR = 9.7 dB at 0.01 % probability on the CCDF, channel bandwidth is 1.2288 MHz; f_1 = 2300 MHz; f_2 = 2400 MHz; RF performance at V_{DS} = 28 V; I_{Dq} = 900 mA; T_{case} = 25 °C; unless otherwise specified; in a class-AB production test circuit.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
G_p	power gain	$P_{L(AV)}$ = 20 W	17.3	18	-	dB
RL_{in}	input return loss	$P_{L(AV)}$ = 20 W	-	−14	-	dB
η_D	drain efficiency	$P_{L(AV)}$ = 20 W	22	27	-	%
$ACPR_{885k}$	adjacent channel power ratio (885 kHz)	$P_{L(AV)}$ = 20 W	-	−46	−40	dBc

7. Test information

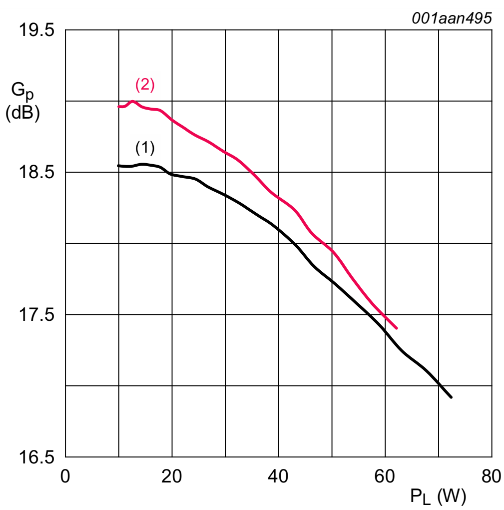
7.1 Ruggedness in class-AB operation

The BLF2425M7L100 and BLF2425M7LS100 are capable of withstanding a load mismatch corresponding to VSWR = 10 : 1 through all phases under the following conditions: V_{DS} = 28 V; I_{Dq} = 900 mA; P_L = 100 W (CW); f = 2300 MHz.

7.2 Graphical data

7.2.1 Single carrier IS-95

Single carrier IS-95 with pilot, paging, sync and 6 traffic channels (Walsh codes 8 - 13). PAR = 9.7 dB at 0.01 % probability on the CCDF. Channel bandwidth is 1.2288 MHz.

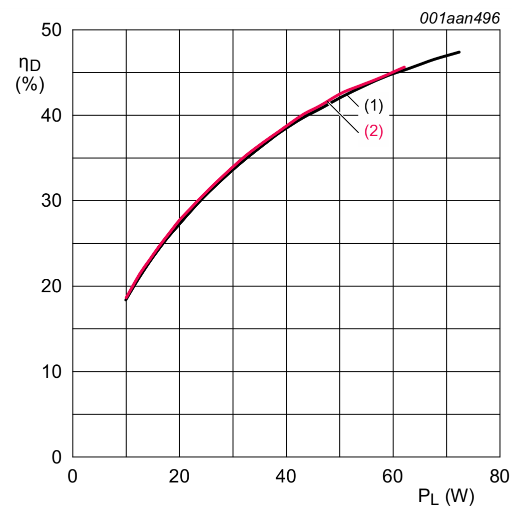


V_{DS} = 28 V; I_{Dq} = 900 mA.

(1) f = 2300 MHz

(2) f = 2400 MHz

Fig 1. Power gain as a function of output power; typical values

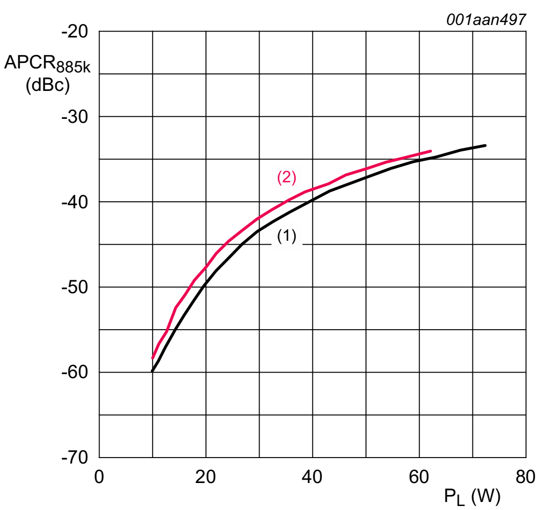


V_{DS} = 28 V; I_{Dq} = 900 mA.

(1) f = 2300 MHz

(2) f = 2400 MHz

Fig 2. Drain efficiency as a function of output power; typical values

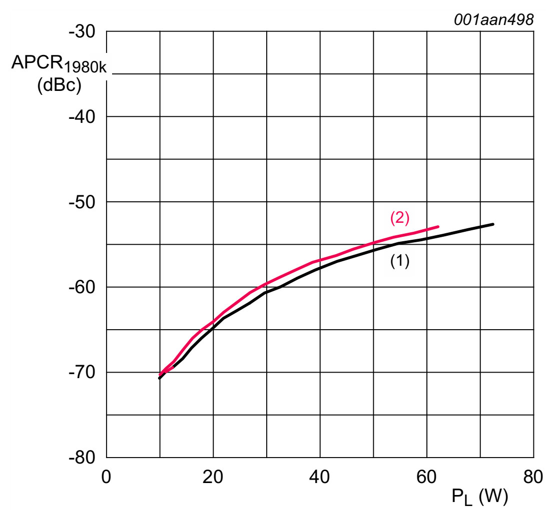


V_{DS} = 28 V; I_{Dq} = 900 mA.

(1) f = 2300 MHz

(2) f = 2400 MHz

Fig 3. Adjacent channel power ratio (885 kHz) as a function of output power; typical values

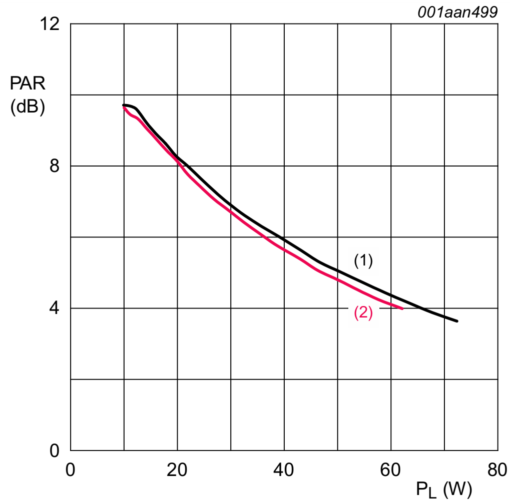


V_{DS} = 28 V; I_{Dq} = 900 mA.

(1) f = 2300 MHz

(2) f = 2400 MHz

Fig 4. Adjacent channel power ratio (1980 kHz) as a function of output power; typical values

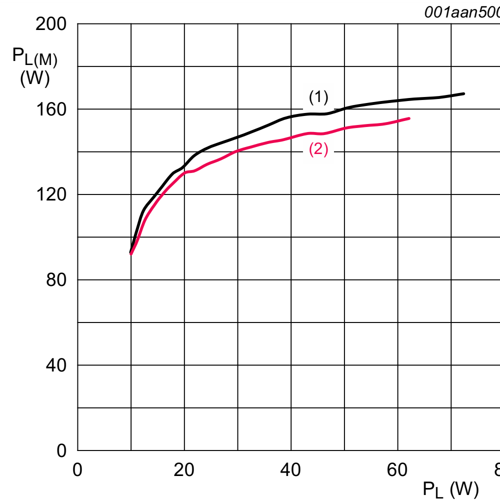


V_{DS} = 28 V; I_{Dq} = 900 mA.

(1) f = 2300 MHz

(2) f = 2400 MHz

Fig 5. Peak-to-average power ratio as a function of output power; typical values



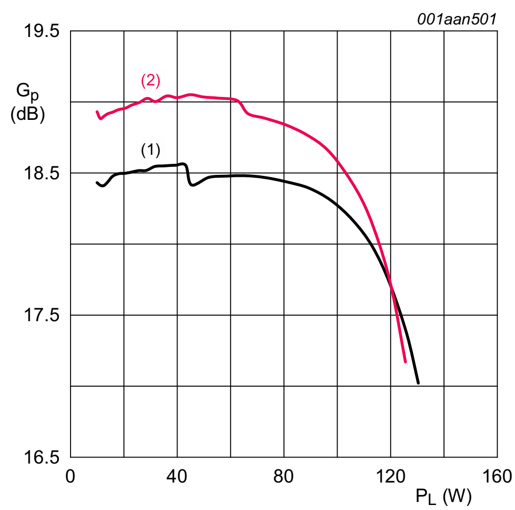
V_{DS} = 28 V; I_{Dq} = 900 mA.

(1) f = 2300 MHz

(2) f = 2400 MHz

Fig 6. Peak power as a function of output power; typical values

7.2.2 Pulsed CW

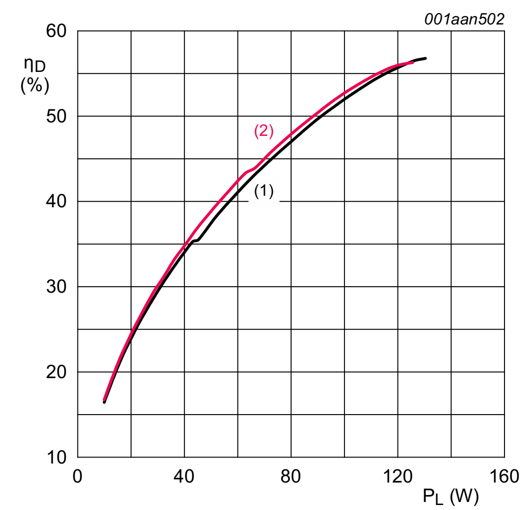


V_{DS} = 28 V; I_{Dq} = 900 mA.

(1) f = 2300 MHz

(2) f = 2400 MHz

Fig 7. Power gain as a function of output power; typical values



V_{DS} = 28 V; I_{Dq} = 900 mA.

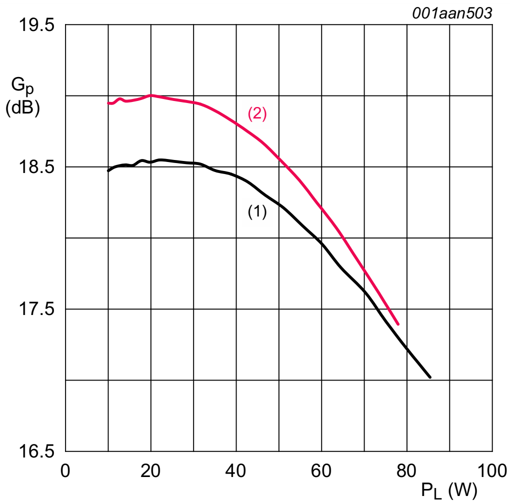
(1) f = 2300 MHz

(2) f = 2400 MHz

Fig 8. Drain efficiency as a function of output power; typical values

7.2.3 Single carrier W-CDMA

3GPP; test model 1; 64 DPCH; PAR = 7.2 dB at 0.01 % probability on CCDF. Channel bandwidth is 3.84 MHz.

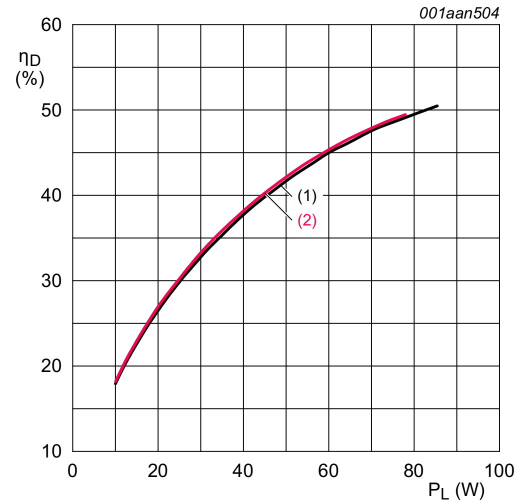


V_{DS} = 28 V; I_{Dq} = 900 mA.

(1) f = 2300 MHz

(2) f = 2400 MHz

Fig 9. Power gain as a function of output power; typical values

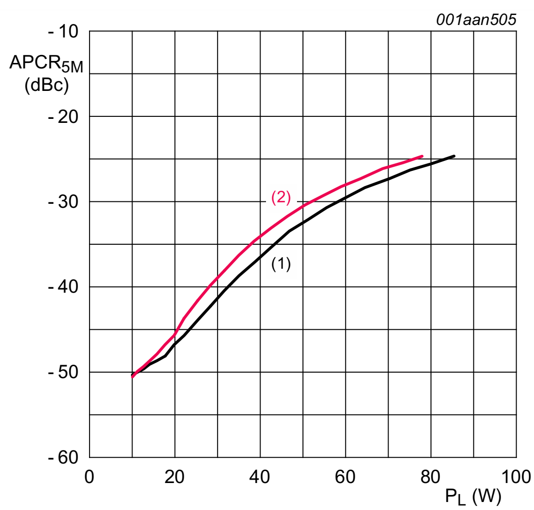


V_{DS} = 28 V; I_{Dq} = 900 mA.

(1) f = 2300 MHz

(2) f = 2400 MHz

Fig 10. Drain efficiency as a function of output power; typical values

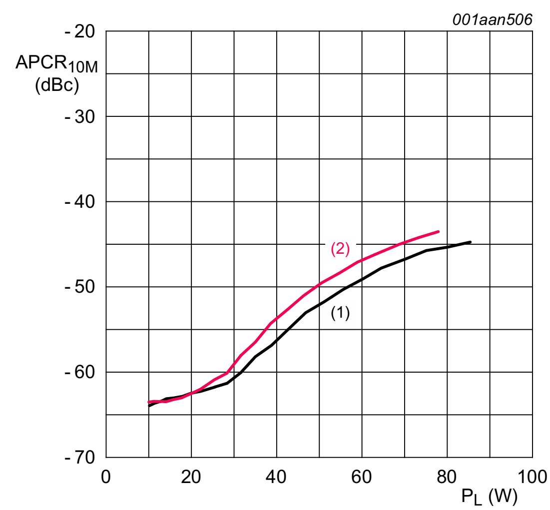


V_{DS} = 28 V; I_{Dq} = 900 mA.

(1) f = 2300 MHz

(2) f = 2400 MHz

Fig 11. Adjacent channel power ratio (5 MHz) as a function of output power; typical values

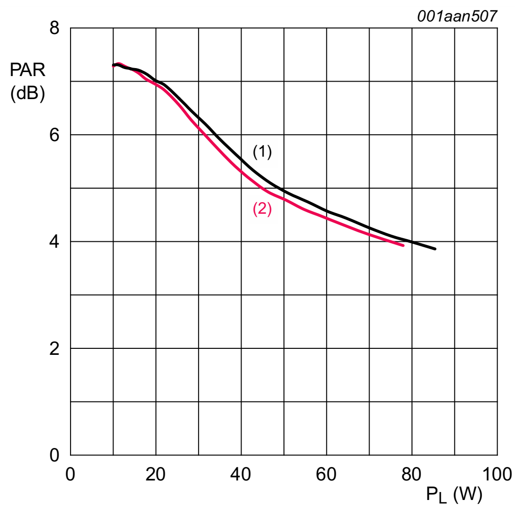


V_{DS} = 28 V; I_{Dq} = 900 mA.

(1) f = 2300 MHz

(2) f = 2400 MHz

Fig 12. Adjacent channel power ratio (10 MHz) as a function of output power; typical values

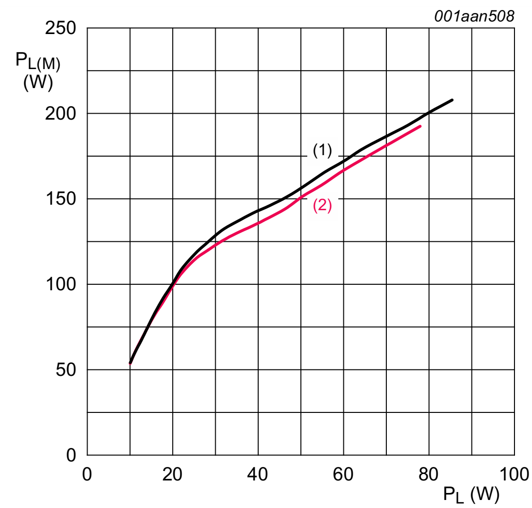


V_{DS} = 28 V; I_{Dq} = 900 mA.

(1) f = 2300 MHz

(2) f = 2400 MHz

Fig 13. Peak-to-average power ratio as a function of output power; typical values



V_{DS} = 28 V; I_{Dq} = 900 mA.

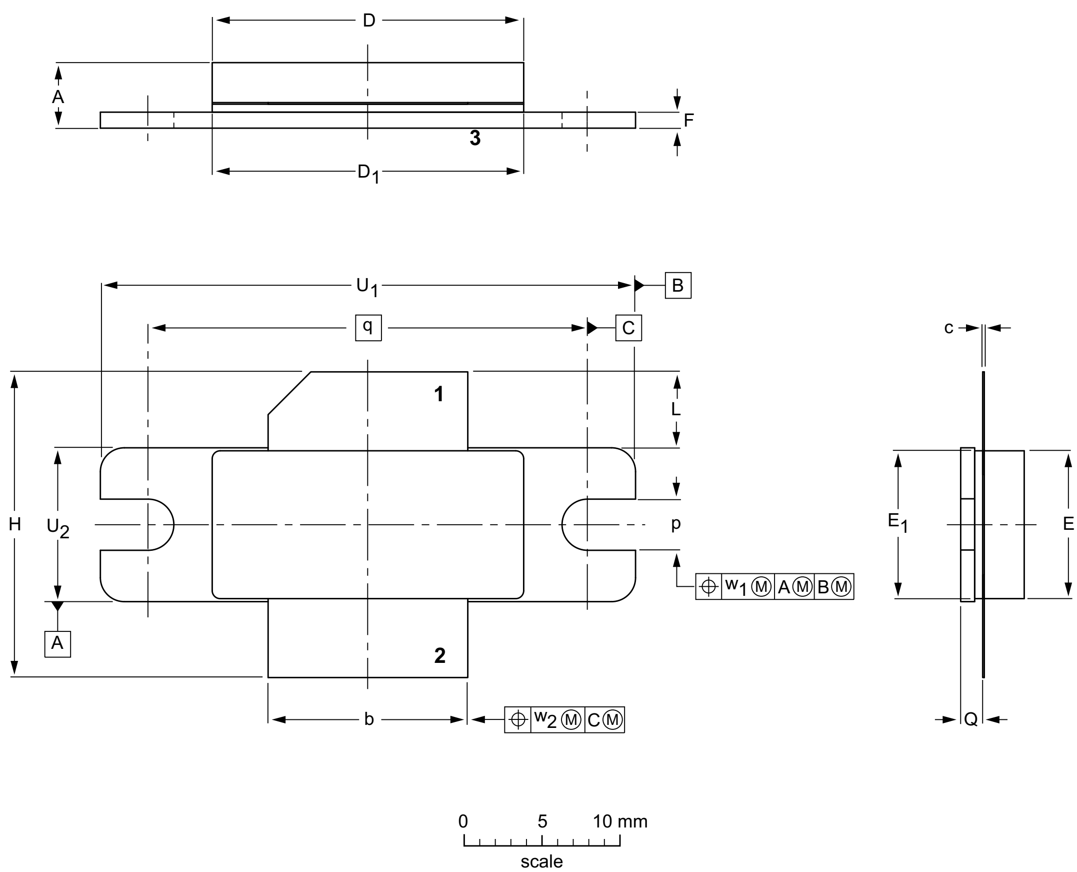
(1) f = 2300 MHz

(2) f = 2400 MHz

Fig 14. Peak output power as a function of output power; typical values

8. Package outline

Flanged ceramic package; 2 mounting holes; 2 leads **SOT502A**



DIMENSIONS (millimetre dimensions are derived from the original inch dimensions)

UNIT	A	b	c	D	D1	E	E1	F	H	L	p	Q	q	U1	U2	w1	w2
mm	4.72 3.43	12.83 12.57	0.15 0.08	20.02 19.61	19.96 19.66	9.50 9.30	9.53 9.25	1.14 0.89	19.94 18.92	5.33 4.32	3.38 3.12	1.70 1.45	27.94	34.16 33.91	9.91 9.65	0.25	0.51
inches	0.186 0.135	0.505 0.495	0.006 0.003	0.788 0.772	0.786 0.774	0.374 0.366	0.375 0.364	0.045 0.035	0.785 0.745	0.210 0.170	0.133 0.123	0.067 0.057	1.100	1.345 1.335	0.390 0.380	0.01	0.02

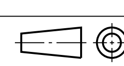
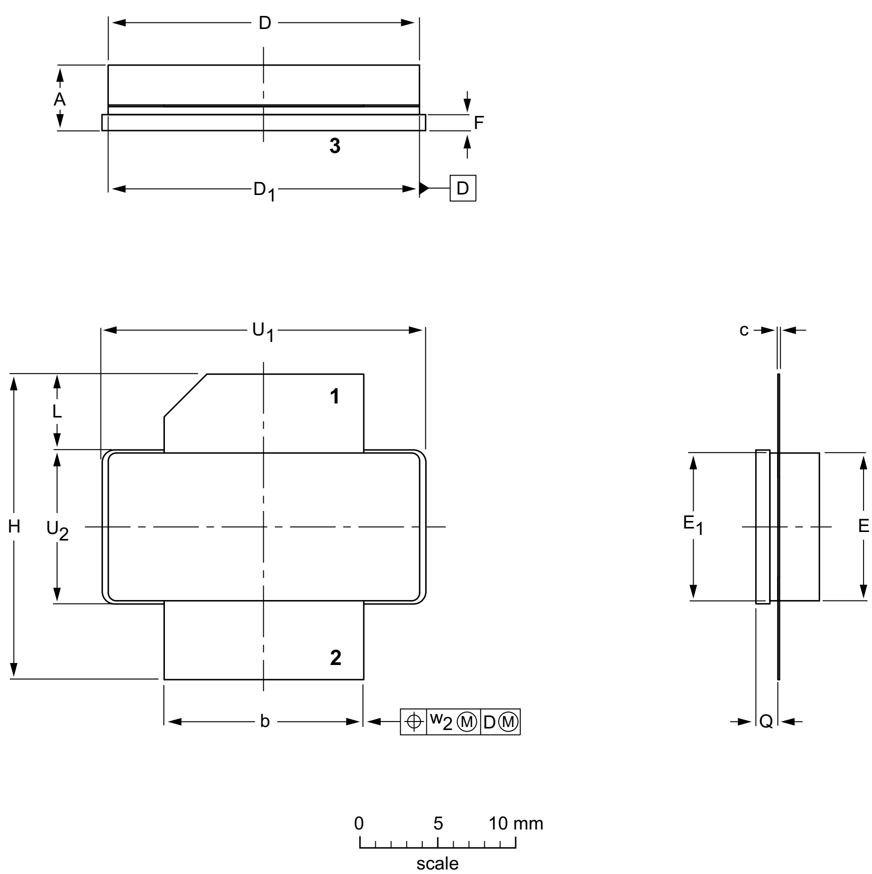
OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT502A						~~03-01-10~~ 12-05-02

Fig 15. Package outline SOT502A

Earless flanged ceramic package; 2 leads **SOT502B**



DIMENSIONS (millimetre dimensions are derived from the original inch dimensions)

UNIT	A	b	c	D	D_1	E	E_1	F	H	L	Q	U_1	U_2	w_2
mm	4.72 3.43	12.83 12.57	0.15 0.08	20.02 19.61	19.96 19.66	9.50 9.30	9.53 9.25	1.14 0.89	19.94 18.92	5.33 4.32	1.70 1.45	20.70 20.45	9.91 9.65	0.25
inches	0.186 0.135	0.505 0.495	0.006 0.003	0.788 0.772	0.786 0.774	0.374 0.366	0.375 0.364	0.045 0.035	0.785 0.745	0.210 0.170	0.067 0.057	0.815 0.805	0.390 0.380	0.010

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT502B						~~07-05-09~~ 12-05-02

Fig 16. Package outline SOT502B

9. Abbreviations

Table 8. Abbreviations

Acronym	Description
3GPP	3rd Generation Partnership Project
CCDF	Complementary Cumulative Distribution Function
CW	Continuous Wave
DPCH	Dedicated Physical CHannel
ESD	ElectroStatic Discharge
IS-95	Interim Standard 95
LDMOS	Laterally Diffused Metal Oxide Semiconductor
PAR	Peak-to-Average Ratio
VSWR	Voltage Standing Wave Ratio
W-CDMA	Wideband Code Division Multiple Access

10. Revision history

Table 9. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BLF2425M7L100_2425M7LS100#2	20150901	Product data sheet	-	BLF2425M7L100_2425M7LS100#1
Modifications:	• The format of this document has been redesigned to comply with the new identity guidelines of Ampleon. • Legal texts have been adapted to the new company name where appropriate.			
BLF2425M7L100_2425M7LS100#1	20131206	Product data sheet	-	-

11. Legal information

11.1 Data sheet status

Document status[1][2]	Product status[3]	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

[1] Please consult the most recently issued document before initiating or completing a design.

[2] The term 'short data sheet' is explained in section "Definitions".

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12. Contact information

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13. Contents

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